WETLAND PLANT IDENTIFICATION

GOAL: To characterize plant communities in a wetland.

Information on the type of plants found in a wetland can tell you a lot about what functions the wetland might be performing. For example:

- Certain plants are important as food and nesting material for various wildlife species.
- Different wetland plants can play a role in filtering out various contaminants from the water.
- Some plants are considered invasive because they displace other plants that are native to the wetland. The presence of invasive plants can indicate that the site has been disturbed by construction activities or by a change in the hydrology.

OBJECTIVE 1: To identify the wetland plants occurring at the site

BACKGROUND

Different plants occur in different parts of a wetland depending on topography, hydrology, and soil type. When you first survey your wetland, you will want to visually identify the different 'zones' in which different wetland communities can be found. This does not have to be precise determination. You should place a field marker in each of these distinct zones and number each marker. These can be added to the master map of the wetland that you create the first time you visit it. These field markers will be your observation points each time you conduct a survey. Plant communities can change throughout a wetland in large and small scales.

- On a broad scale: You have submerged and floating plants like duckweed and pond lilies that live in several inches or more of standing water. Other emergent plants like cattails and blue-flag iris are found in standing water but they are also able to tolerate drier conditions and you can find them on the edge of the water. Higher in the landscape, other herbaceous plants and shrubs which tolerate saturated soils will take hold (although button bush shrubs can tolerate standing water). While some trees can tolerate year-round water-logged roots (bald cypress, for example), or short-term flooding, most trees will be found higher up in the wetland.
- On a smaller scale: What appears to be a continuous emergent marsh may have slight rises and dips in the ground which create pockets of slightly wetter and slightly drier areas. Plants that have adapted to these different conditions will occupy their preferred patch. That can explain why you may find discrete patches of arrowhead among dense stands of cattail, for example.

BEFORE YOU CONDUCT YOUR PLANT SURVEY

Before you start identifying wetland plants. you will need to learn the basic parts of the plant and some of the ways in which they are grouped in field guides.

- This chapter includes a few pages of illustrations of various plant parts and "keyed" features. For example, knowing whether the leaves are alternate, opposite. or whorled will greatly help in narrowing down the possible plants your specimen may be. A glossary of plant terms is also included to assist you with using field guides.

There are several resources available for helping you to identify wetland plants.

- A complete list of wetland plants found in Indiana is provided in the Appendix.

- This chapter includes illustrations of 64 of the most common herbaceous and woody plants found in Indiana. Each plant also has some field notes on habitat, flowering season, and plant appearance. You are probably already familiar with some of these, like skunk cabbage and New England Aster. Acquainting yourself with the plants in this section will give you a head start in your field identification. This is not intended to be a complete guide but a foundation upon which you can add your own field illustrations, photos, and pictures from other field guides. Find the system that works best for you.

- The Indiana Resource section contains a list of plant field guides in book form as well as some on-line guides.

- If you have trouble identifying a plant, take a photo and ask a local botanist for assistance. The Indiana Resource section and Chapter 5 has suggestions of where to go for help.

- Do not pick plant specimens unless you have been advised by a botanist that is familiar with your site. You may inadvertently pick a rare or endangered plant. Remember, it may appear to be a large population at your wetland but your site may be one of only a few in the state where the species occurs.

The "indicator status" of plants refers to the likelihood of it being found in a wetland versus an upland area.

- Obligate species, like button bush, are plants that are found 99% of the time in wetlands.

- Facultative species, like lily-of-the-valley, are plants that are equally likely to be found in a wetland as an upland.

- Facultative-wet species, like Devil's beggar-ticks, are found between 66-99 % of the time in wetlands. And upland species are found nearly always in uplands.

- Different plant guides may not agree on the indicator status for every species. But in general, you can get a good idea of the quality of a wetland by determining the status of the plants in it. For example, if you conduct a plant survey and find that 80% of the species are obligate indicators, then the wetland is t likely to be a high quality wetland.

SURVEY INSTRUCTIONS

- Different plant species appear throughout the growing season. A survey of plants found in April will give you a vastly different picture of your wetland than a survey conducted in October. Therefore, to develop the best description of your wetland, a plant survey should be conducted each month during the growing season. You will find that a certain percentage of the plants like the shrubs and trees will remain the same while many of the herbaceous, flowering plants, will change throughout the season.

Step 1: Determine your observation points

- Visually identify the distinct plant 'zones' in your wetland. Sometime this can be viewed as vertical layers of the wetland with layers running from the edge of open water to the shore line to a wet field to a wooded area furthest from the water's edge. You can simply "eyeball" the transition from the driest (highest) part of the wetland to the wettest (lowest) part. Keep in mind that slight changes in the landscape can create depressions scattered throughout otherwise drier areas. By sampling each of the distinct areas of your wetland, you will be able to collect the most representative information describing the site.

- Place a field stake in each of the distinct zone or plant communities to be surveyed (up to 3). For example, if your wetland occurs along a lake edge at the base of a steep ridge, you may want to place one survey markers on the wet 'seep' slope, one at the base of the slope or along a flat area, and one at the water's edge (or in the water if there is an aquatic plant community). Stakes are available in the wetland field kits (see details at start of Chapter 4).

- Label your stake with a number or letter that helps you identify it each time you survey the wetland. Make sure the stake is visible to anyone walking through the wetland so that no one trips over it. You may want to write "Ongoing study, Please do not disturb" on the stake or flagging (tape) that you attach to the stake.

- Indicate on your master wetland map the location of each of these stakes. You can use the compass and measuring tape provided in the wetland field kit to help you map the location of these markers.

Step 2: Identify the plants at each observation point

- Making sure that you survey at each point, identify the most common plants in each of the vegetative layers present including herbaceous, shrub, and tree. For small plant parts, you can use the plant lens (magnifying glass) provided in the wetland field kit.

- If your wetland runs along the fringe of a lake, you may only have an aquatic and herbaceous layers present. Some floodplain forests may have primarily trees and a few herbaceous species due to the intense scouring and flooding from adjacent streams or rivers.

Step 3: Record you observations

- On the Data Form, for each species you identify, indicate the vegetative layer, the common name, the scientific name, and the indicator status.

- Some plants like the sedges and grasses are very difficult to identify to species. In these cases, you can simply list 'grass' or 'sedge' as the common name, and a genus if you can determine that.

OBJECTIVE 2: To identify the dominant plant(s) in each vegetative layer

BACKGROUND

Dominant species are those that make up the majority of plants in a particular area. For example, as you hike through some woods, it may be readily apparent that most of the trees are beech or oak or maple. There are other trees present but not nearly to the extent that the dominant species are. A marsh may be dominated by waterlilies or cattails; a sedge meadow may be dominated by two or three species of sedges; a scrub-shrub wetland may be dominated by willow, alder, dogwood and a one or two herbaceous plants. It make take some practice before you feel comfortable making the judgement of which species dominate a particular plant community. Ask a botanist to visit the site with you.

SURVEY INSTRUCTIONS

Step 1: Identify the dominant plant species

- Based on the species you found in your initial plant survey, determine visually which ones dominate each vegetative layer that is present in your wetland. This is not intended to be a precise measurement. You should be able to "eyeball" it.

Step 2: Record your observations

- On the Survey Form, identify up to three dominant species in each layer that is present. Indicate the common name and scientific name.

OBJECTIVE 3: To monitor for invasive plants

BACKGROUND

Invasive plants are those that force out or 'out-compete' other wetland plants that naturally occurred at the site before the invasive species was introduced. Invasive plants can become so dominant in a wetland that few or no other plants occur there.

- Although not always the case, wetlands with a greater number of plant species can offer a greater variety of wildlife habitats. A wetland that is completely covered by reed canary grass, for example, if often considered of lower 'value' than a similar wetland with numerous wetland plant species.
- Invasive plants can be native or non-native to a region in which they are found. For example, the species of purple loosestrife that is such a nuisance in many of America's wetlands is native to Europe. It was transplanted here without its native insect predators so it has spread out of control. Other wetland plants that are considered invasive may be native to our country but have spread from ornamental gardens into the wild or may have taken on a dominant role in our wetland because a natural predator or competing plant has been removed (due to natural or manmade causes).

- Invasive plants have a tendency to "pioneer" or take root quickly in disturbed sites. Wetlands that have been dredged, drained, plowed, or other wise altered often are taken over by invasive plants that are growing in the area (through wind or water-born pollination, for example).

- Some plant nurseries and landscaping businesses still use invasive plants. Help educate the plant businesses in your community about the problems with selling invasive species.

BEFORE YOU CONDUCT YOUR SURVEY

- Illustrations of nine of the most common wetland invasive plants in Indiana are provided in this chapter. Familiarize yourself with the field identification tips for each one. One of the illustrations is of native Canada grass (also called blue joint grass). This species can be frequent in wetlands in northern counties and may be confused with reed canarygrass - one of the worst invasive species. Familiarize yourself with the differences between these two species.

SURVEY INSTRUCTIONS

Step 1: Identify any invasive plants at the wetland

- Identify which invasive plants, if any, occur at your wetland.

- Monitor for these species each time you visit your wetland. Look for any visible change in the size of the population. For example, you may observe giant reed grass covering less than 1/4 of the open water area when visit in the Spring, and then observe it spread to 1/2 of the area by the end of the growing season or at the start of the next season.

Step 2: Record you observations

- Complete the Survey Form for each species you observe including where you found it, its name, and an estimated population size.

Wetland Plant Survey Form

Date:_____ Time:_____ Weather Conditions:_____

Wetland Name (assign one if not already existing):_____

Wetland Location:_____
(street/reference point or latitude & longitude)

City:_____ Zip:_____ County:_____

Wetland Owner (name and address):_____

_____

Monitor (name, address, phone/E-mail):_____

_____

Wetland Plant Survey

1. Conduct a plant survey of your wetland once a month during the growing season (~April - October)
2. Identify up to three distinct zone or plant communities that follow a natural transition from the driest to the wettest areas. Use a field stake to mark a monitoring station in each distinct zone.
3. Making sure to visit each station, identify up to 10 plants for each vegetation layer (horizontal layer) that is present in the wetland.
4. Fill out the Survey Form with where each plant was found, its name, and its wetland indicator status.
5. Send a copy of the completed form to the IDEM Volunteer Water Quality Monitoring Program. at PO Box 6015, Indianapolis, IN 46202

Station Number	Layer (A,H,S,T)	Common Name	Scientific Name (Genus species)	Indicator Status O/FW/FU

Wetland Plant Survey (additional spaces provided if needed)

Station Number	Layer* (A,H,S,T)	Common Name	Scientific Name (Genus, species)	Indicator Status**

* A=aquatic; H=herbaceous other than aquatic; S=shrub; T=tree

** O=obligate; FW=facultative-wet; F=facultative; U=upland (see Chapter 1,4 for an explanation; See the Appendix for the U.S. Fish and Wildlife Service's plant list with indicator status.

Dominant Plant Survey

1. Determine which of the plant species you observed are dominant based on visually comparing the relative abundance of different plant species present at the site. A quantitative measurement is not required. If oaks, maples, and ash trees are all present, and oaks clearly outnumber the maples and ash by several fold, then the oak is a dominant tree in that wetland. If oak and maple are equally abundant and only a few trees of other species are present, then list both the oak and maple as dominant trees.
2. Fill out the Survey Form with up to three (3) dominant (most abundant) plant species for each of the three vegetative layers that is present.
3. Send a copy of the completed form to the IDEM Volunteer Water Quality Monitoring Program. at PO Box 6015, Indianapolis, IN 46202

Layer	Common Name	Scientific Name (Genus species)
Herbaceous		
Shrub		
Tree		

Invasive Plant Survey

1. Survey your wetland for each of the invasive plants identified in the illustrations found in this chapter.
2. For each invasive species you observe, fill out the Survey Form with where it was found, its name, and an estimated population size. If you can easily count the number of individuals, then list a number. If the plant is present in large amounts that can't be counted, estimate the percentage of the area that is covered by that plant.
3. Send a copy of the completed form to the IDEM Volunteer Water Quality Monitoring Program. at PO Box 6015, Indianapolis, IN 46202

Layer* (A,H,S,T)	Common Name	Scientific Name (Genus species)	Field Notes (location, amount**)

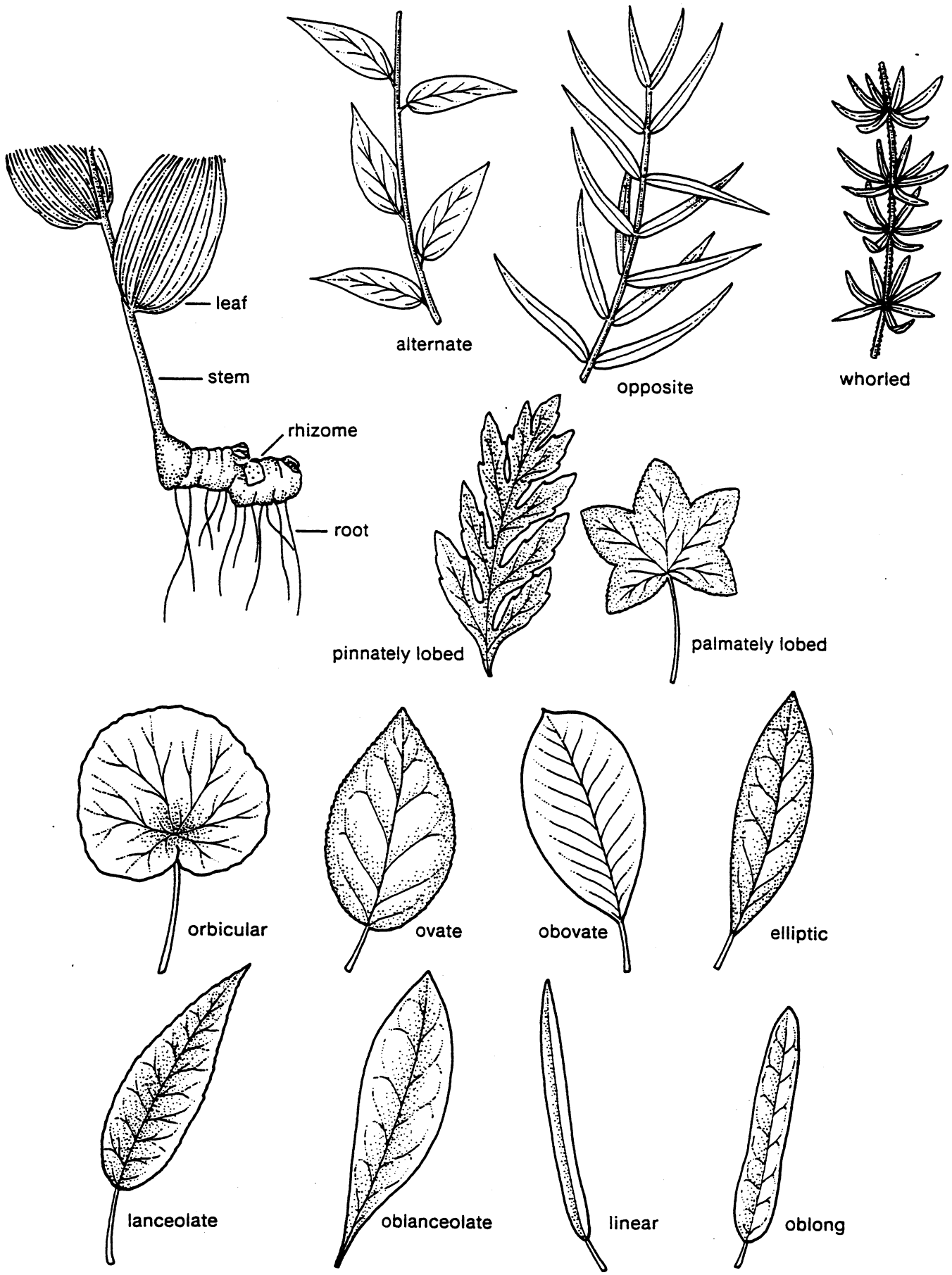
* A=aquatic; H=herbaceous other than aquatic; S=shrub; T=tree

** Amount can be the number of individuals if it is a minor presence (e.g., ~25 purple loosestrife plants) or an estimated percentage cover if it is a significant presence (e.g., 1/4 of open water covered by reed canary grass).

COMMON WETLAND PLANTS OF INDIANA

A SELECTION OF 64 SPECIES INCLUDING GRASSES, FORBS, SHRUBS, AND TREES

Illustrations and text from: *Midwestern Wetland Flora, Field Office Guide to Plant Species,*
USDA Soil Conservation Service, Midwest National Technical Office, Lincoln, Nebraska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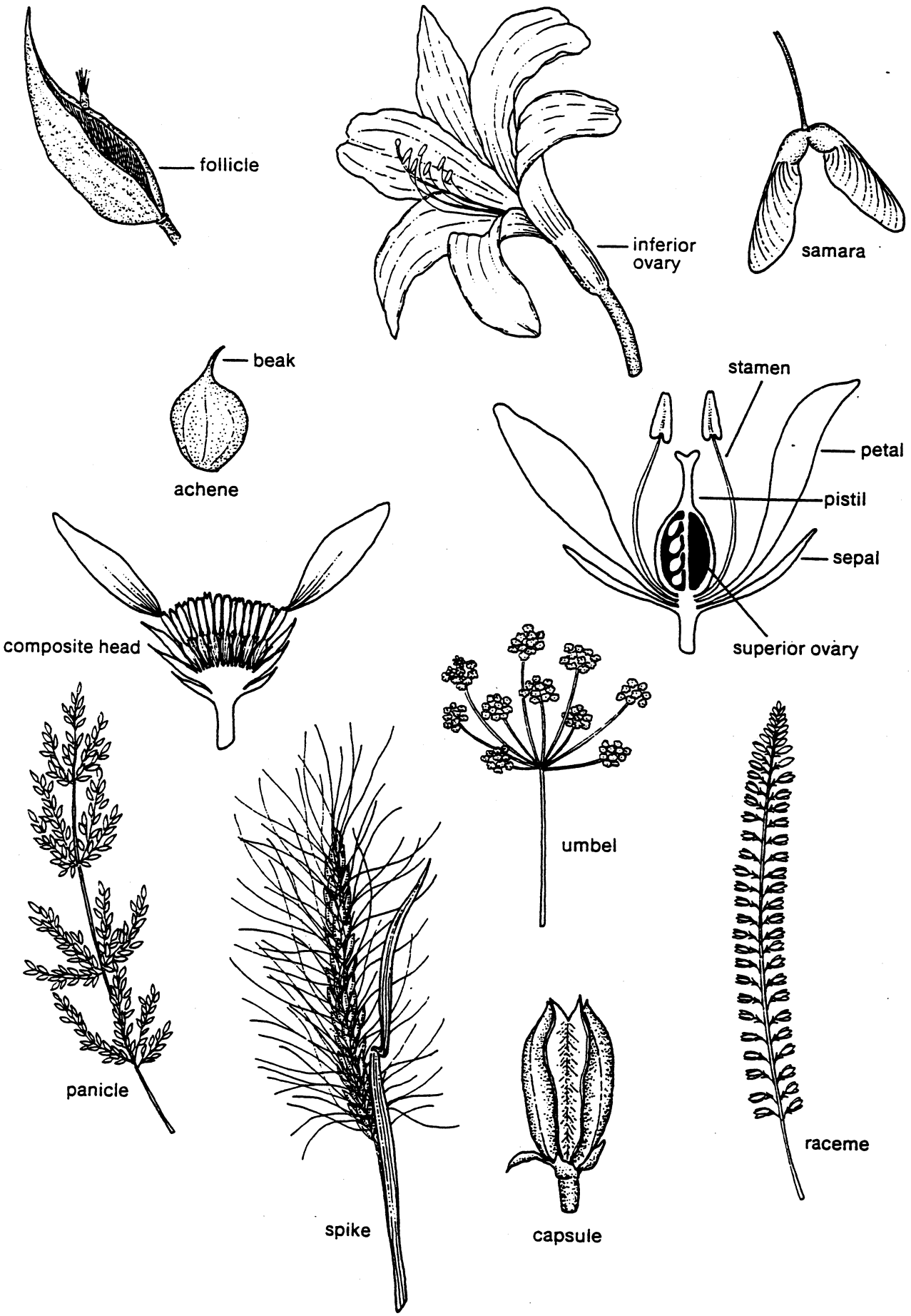
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petal
pistil
sepal
superior ovary
composite head
umbel
panicle
spike
capsule
raceme

GLOSSARY

Achene. A one-seeded, dry, indehiscent fruit with the seed coat not attached to the mature ovary wall.

Annual. Living only for one year.

Awn. A bristle-like process.

Berry. A fruit with the seeds surrounded only by fleshy material.

Biennial. Living for two years.

Bract. An accessory structure at the base of some flowers, usually appearing leaflike.

Bracteole. A secondary bract.

Bristle. A stiff hair.

Capsule. A dry, dehiscent fruit splitting into 3 or more parts.

Ciliate. Bearing marginal hairs.

Clasping. Said of leaves that partially encircle the stem at the base.

Corolla. All the petals of a flower.

Cyme. A type of inflorescence in which the central flowers open first.

Dehiscent. Splitting at maturity.

Drupe. A fruit with the seed surrounded by a hard, dry covering which, in turn, is surrounded by fleshy material.

Ellipsoid. Referring to a solid object that is broadest at the middle, gradually tapering to both ends.

Elliptic. Broadest at the middle, gradually tapering to both ends.

Fibrous. Referring to a cluster of slender roots, all with the same diameter.

Filament. The stalk of a stamen.

Follicle. A dry, dehiscent fruit that splits along one side at maturity.

Glaucous. Having a bluish appearance.

Glume. A sterile scale found in grasses.

Indehiscent. Not splitting open at maturity.

Inferior. Referring to the position of the ovary when it is below the point of attachment of the sepals and petals.

Inflorescence. A cluster of flowers.

Lanceolate. Lance-shaped; broadest near the base, gradually tapering to the narrower apex.

Lanceoloid. Referring to a solid object that is broadest near the base, gradually tapering to the narrower apex.

Lemma. A fertile scale found in grasses.

Linear. Elongated and uniform in width throughout.

Nutlet. A small nut.

Oblanceolate. Reverse lance-shaped; broadest at the apex, gradually tapering to the narrower base.

Oblong. Broadest at the middle, and tapering to both ends, but broader than elliptic.

Oblongoid. Referring to a solid object that, in side view, is nearly the same width throughout.

Obovate. Broadly rounded at the apex, becoming narrowed below.

Obovoid. Referring to a solid object that is broadly rounded at the apex, becoming narrowed below.

Orbicular. Round.

Ovary. That part of the pistil that contains the ovules.

Ovate. Broadly rounded at the base, becoming narrowed above; broader than lanceolate.

Ovoid. Referring to a solid object that is broadly rounded at the base, becoming narrowed above.

Ovule. Immature seed.

Palmate. Divided radiately, like the fingers of a hand.

Panicle. An arrangement of flowers consisting of several racemes.

Perennial. Living for 3 or more years.

Perianth. All the sepals and petals of a flower.

Perigynium. A sac-like structure enclosing the pistil in *Carex*.

Pinnate. Divided once along an elongated axis into distinct segments.

Pistil. The ovule-producing part of the flower.

Prostrate. Lying flat on the ground.

Raceme. A grouping of flowers along an elongated axis where each flower has its own stalk.

Receptacle. That part of the flower to which the sepals, petals, stamens, and pistils are usually attached.

Rhizome. An underground, horizontal stem.

Samara. An indehiscent winged fruit.

Scale. A tiny, leaflike structure; the structure that subtends each flower in a grass or sedge.

Spadix. A fleshy axis in which flowers are embedded.

Spathe. A large bract subtending or sometimes enclosing a cluster of flowers.

Spike. A grouping of flowers along an elongated axis where each flower lacks a stalk.

Spikelet. A small spike.

Stamen. The pollen-producing organ of a flower.

Stigma. The terminal part of a pistil.

Stolon. A horizontal stem lying on the surface of the soil.

Style. That part of the pistil between the ovary and the stigma.

Succulent. Fleshy.

Superior. Referring to the position of the ovary when it is above the point of attachment of the sepals, petals, stamens, and pistils.

Tubercle. A wart-like process.

Umbel. A cluster of flowers in which the flower stalks arise from the same level.

Valve. The wing of the fruit in *Rumex*.

Whorl. An arrangement of 3 or more structures at a point on the stem.